Alien Shopping Spree

Subject: Life science, Human Influence, Math

Grade: 6-9

Lesson Topic: Human weed sources

Length: variable

Learner Objective:

Students will determine origins of seed sources other than natural dispersal

Students will explore their State Laws governing agricultural seed impurities in the products we buy

Introduction:

When we buy grass seed or farmers buy crop seed there are state laws that govern the percentage of allowable weed seed that can be present in the products we buy (the seed is then "certified"). For example, wild oat seed is a noxious weed and there may be no more than 45 seeds per pound of grain seed that a farmer may buy (in Oregon). The same type of laws apply to grass seed for our lawns or in the wildflower mixes we buy. It is important that the labeling of these products indicate the percentage of weed seed (contamination levels) and the potential type of seed so we can prevent possible invasion of those noxious species.

Content:

State and Federal laws determine the allowable level of contaminants in agricultural and commercial seed products sold, "certifying" the seed products as not containing more than a certain percentage of noxious weed seed. Labeling laws are somewhat more confusing and often the consumer is unaware of certifying or labeling laws that may or may not affect the choices made at the check-out counter. A result of an uninformed public may be the accelerated establishment of non-native and noxious plant species.

Materials and Supplies:

Samples of seed products from various sources (see below)

Magnifying glasses

Weed journals for recording information about seed products

Anticipatory Set:

Display a container of commercial wildflower mix and engage a discussion of what it is, why people desire the product, how many of the students have used it (or seen their parents use it) and if they think it might be a source of invasive weed species. For advanced classes you may discuss the issue of introducing "native" wildflowers that are not indigenous to the local habitat, and by extension, have a discussion about what is truly native (geographical vs. genetic relatedness).

Activity Outline:

Either you or the students will need to collect an assortment of seed sources that may contain noxious weeds. Possible sources include:

- Farm and garden stores (grass, wildflowers, feed)
- Nurseries (grass, wildflowers, vegetable and flower seed)
- Large 'box" stores (grass, wildflowers, vegetable and flower seed)
- County seed growers associations and co-ops (grass, crop seed, feed)

Depending on the number and variety of products, students may work individually or in teams. The students will examine the package labels to determine pertinent information (source, seed types, percentages of species, allowable weed seed amount, etc.). Allow the students to fully examine the labeling and discuss whether or not it provides all the information needed if a person was concerned about invasive weed species or issues of being truly "native." A suggested outline for a data table in their weed journals is displayed below.

Product Name

Seed Type	Seed Source	% Weed Seed	Weed Species Present	Quantity	Price	State Laws Yes/no

Distributor:
Other Labeling Information:

Students should examine a 10 g sample of seed, separating any impurities different than the intended seed. If they find seeds that are different than the intended seed (potential weed seed) they should calculate the percentage of weed seed and compare their figure to the allowable contamination rate. Students should describe the variety of contaminants in their sample (in some cases companies use inert fillers or allow other contaminants such as dirt and twigs).

How would they determine the percentage of contaminants in a mixed species product such as in "wildflower meadows"? Have them design a procedure for making this determination and, if time allows (or as an extension) have them carry out their procedure.

Students should also contact their county agents to research the state laws, kinds of seeds sold in their community and to determine any correlation between existing county weed problems and allowable contamination rates of weed species in the products sold locally. Consider the implications and ramifications if your students discovered a direct correlation! Students can affect change and make a difference in their community through their in-school investigations!

Have students collect invasive weed seed from the dominant weed plants in their area and design and Invasive Weed Seed Identification pamphlet. Use this guide to identify contaminants in the seed products sold in their area.

Closure and Assessment:

Collate and review the records of all possible weed contamination sources the students have found in their community. Discuss why it is important for people to know the types of weed seeds they may be purchasing. Would they buy a product that did not advertise the percentage and type of contaminant seed? Why or why not? Discuss the impact that might occur in their community if a product's marketing program was highly successful and the potential for invasive weeds existed with that product.

Examine their weed journals for completeness of records kept on all aspects of the products they examined.

Independent Practice and Related Activities:

Students interested in a long-term study can extend any of the suggested activities above. Because germination and knowledge of plant identification may be the only way to determine the presence of potential invasive seed, students will need to be aware of the time involved to conduct these studies, as well as, the correct disposal methods for any noxious weeds grown in the course of their investigations.

Resources:

Grain growers, seed co-ops, county extension, county agricultural agents, feed stores, nurseries and plant stores.

Laws governing contamination rates can be found on the Internet by searching state and federal agricultural department web sites. By typing the phrases, *"weed content" + "state law"* or *"certified seed"* into a favorite search engine, students can gain additional information about these laws.

Vocabulary:

Certified, contaminants, native

National Science Education Standards:

Science as Inquiry - CONTENT STANDARD A:

As a result of activities in grades 5-8, all students should develop

- ❑ Abilities necessary to do scientific inquiry
- ❑ Understandings about scientific inquiry

Life Science - CONTENT STANDARD C:

As a result of their activities in grades 5-8, all students should develop understanding of

- ❑ Structure and function in living systems
- ❑ Regulation and behavior
- ❑ Populations and ecosystems
- ❑ Diversity and adaptations of organisms

Science in Personal and Social Perspectives - CONTENT STANDARD F:

As a result of activities in grades 5-8, all students should develop understanding of

- ❑ Populations, resources, and environments
- ❑ Risks and benefits